

Raborg (S. A.) With Compts of the Author

THE INDUCTION
OF
PREMATURE LABOR

BY AN

INTERRUPTED-CURRENT DOUCHE OF HOT WATER.

BY

✓
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THE INDUCTION OF PREMATURE LABOR BY AN INTERRUPTED-CURRENT DOUCHE OF HOT WATER.¹

THE important and very thorough papers read before the obstetrical section of the New York Academy of Medicine last year, by Prof. Isaac E. Taylor, on "What is the Best Treatment in Contracted Pelves?" are still fresh in the minds of the profession. As these referred entirely to the character of procedure in operating when the physician finds himself with a case of contracted pelvis at full term, I desire to place before you some views and experience in cases where the deformity is known to the practitioner in the early stages of pregnancy. The best writers, both in the Old and New World, now assert that, under such circumstances, the duty of the medical attendant is to produce premature labor at such period as will conduce with greatest certainty to the safety of both mother and child. This being decided, it becomes a matter of serious consideration to appoint a time beyond which the mother cannot with safety to either pass through labor.

¹ Read before the County Medical Society, September 25, 1876.

It is easily seen that this must differ in almost every case, as the size, shape, and deformity of pelvis, as well as the apparent size, weight, sex, and condition of child, must be carefully studied to arrive at a proper conclusion. An important element of success, also, in performing any operative procedure affecting childbirth, where haste is not a necessity, is to do so gradually and with as little instrumental interference as possible; in other words, to make the labor simulate, as near as is in our power, a natural effort at term.

Cases requiring the induction of premature labor should be divided into two classes:

1. Those where the life of the mother or child, or both, is in immediate and pressing danger.

2. Those where the mother cannot, with safety to herself or the child, go to the full term of natural pregnancy.

The first class includes puerperal convulsions, hæmorrhages from placenta præviæ, or other causes; threatened death of mother from heart-disease, phthisis, or other trouble, where the fœtus still shows vitality, etc.

In the second class are:

1. Malformation of the pelvis where the antero-posterior diameter is as much as two and three-quarters inches.

2. In cases of women who, from some disease in placenta or other cause, are in the habit of having dead children if allowed to go to full term.

3. Where the pelvic diameters are decreased by abnormal growths.

4. Excessive and exhausting vomiting.

5. Heart-disease of the mother, where the serous infiltration of the tissues is so great as to threaten the lives of both.

6. Renal disease, threatening puerperal convulsions, or renal derangement of so marked a character as to load the urine with albumen.

7. Excessive amniotic dropsy.

Regarding the first class, undoubtedly the duty of the practitioner is to use whatever means of delivery promises to be most rapid, and at the same time offers the greatest chance of safety to both.

When, however, we approach the consideration of treat-

ment, or surgical intervention in the second class, the case is materially altered.

Here there is no immediate danger, no excuse for rashness or haste. Cazeaux, in speaking of this subject, says: "The best operation is that which is the most uniformly and rapidly successful, at the same time that it affords the greatest security to both mother and child." This aptly applies to the first class, but not to the second. Nature does not perform this work in a short time. We know that at term there is always a preparatory stage of a week or more: then why not try to reach an operative procedure which will, as near as possible, imitate natural labor? Many measures have been proposed for this purpose, having in view the fact that less risk would attend premature delivery if it could be induced without absolutely passing into the confines of the uterus with surgical or other means. In the earlier times bleeding was advised; afterward stimulating the womb by reflex action—by mustard-plasters and blisters over breasts. Scanzoni recommended the application of gum-elastic cups over the breasts. Then came external manipulation over the abdomen to excite uterine contraction; and, again, ergot had its day. But probably the person who more thoroughly appreciated the position than any other was Prof. Kiwisch, of Wurtzburg, who, in 1846, introduced the use of the vaginal douche by an injection-pipe, closely resembling the one now sold in the stores called the fountain-syringe. His plan is known to you all. He entered the nozzle of the syringe high up in the vagina, and directed a steady current of hot water against the os for some minutes. This was repeated at intervals, until the muscular coat of the uterus was excited to contraction. Many modifications of this operation have been attempted.¹ "M. Blot on several occasions even inserted the canula into the neck, so that the jet reached and detached the membranes. This is well calculated to bring on labor within a very short time." The practice of Tyler Smith in using alternately the cold and hot currents of water has never been received favorably in this country; it certainly would suggest danger by shock to the nervous system, and to a deli-

¹ Cazeaux, pp. 1011.

cate constitution the rapid change from one extreme of temperature to the other might be productive of the worst consequences.

"Dr. Cohen, Dr. Leopold Harting, and Dr. Stultz, introduced a small tube through the os uteri, and directed the stream of water between the walls of the uterus and the membranes. Twenty-three cases have been recorded by them."¹

During the last six years I have performed on the same patient the operation of Kiwisch once, and twice a modification of his method by substituting an interrupted current, as is caused by the Davidson syringe.

My purpose to-night is to mention as briefly as possible the notes of two of these cases, and then demonstrate as fully as I can the advantages of the interrupted current in producing a character of labor which simulates very much the natural effort at term. I will first give a synopsis of the accouchements of the mother of the lady above referred to:

Mrs. H., the mother, from her husband's account, was a brunette of medium size, in good health when he married her, and gave birth to her first child when she was twenty-five years old. The history of the labors of this lady is very vague, but I will recite it as it was given to me. The first child was a boy, and, in order to deliver him, her physician was obliged to perform craniotomy first, and then version. One year later a second child was brought into the world in the same way. Thirteen months from this period she had a miscarriage of some four months. Sixteen months after this, a small girl child, born with instruments and supposed to have been dead *in utero* a month before delivery. A year and a half later, another male child was destroyed and then delivered. The sixth child, a girl, and my present patient, was born prematurely and safely at seven months.

The birth was not hastened by any interference of her medical attendant, and the mother was not aware of any reason for the early delivery of the child. The babe weighed, after it had been wrapped up in flannel, only two and a half pounds, according to the statement of the father, but I pre-

¹ Churchill, "System of Midwifery," pp. 308.

sume this must be an exaggeration. About twenty months after the birth of this little girl, Mrs. H. had a seventh child, a boy, which was destroyed and taken from her. An hour after the operation, the unfortunate lady died of hæmorrhage and exhaustion. The only child she left, the little girl above referred to, grew up to womanhood, and at the age of eighteen and a half years married a Mr. L. Ten months after her wedded life began, a distinguished German physician was called to attend her in labor. He found a contracted pelvis, and, seeing that a natural delivery was impossible, he performed craniotomy and afterward version.

In the latter operation he fractured one leg and one arm of the infant, and finally succeeded in delivering it, but at the same time rupturing the entire perinæum into the rectum of Mrs. L. Before the child was delivered the lady had several puerperal convulsions. She was confined to her bed for three months after this delivery; her urine was drawn from her with a catheter for over two weeks, and for a long time, until the formation of cicatricial tissue, she had no power over the sphincter ani. Ten months later she had a miscarriage of eleven weeks. The third pregnancy culminated thirteen months after this miscarriage, when a daughter, still alive, was born with forceps. This child was very small, weighing about five pounds. Twenty-one months later she successfully delivered, without surgical intervention, a very small boy, weighing a little over four pounds. This child also lived. Two years and one month later her fifth child, a boy, was destroyed and delivered.

About fifteen months after the last birth I have recorded, Mrs. L. called on me and stated that her physician, who had taken charge of her through her five previous pregnancies, had gone abroad, and she desired to place herself under my care, and gave the above history. Upon examination I found her to have the following proportions: height in stocking-feet, fifty-nine and a half inches, or half an inch less than five feet. Assisted by Prof. F. N. Otis I made a careful examination of the diameters of the pelvis, and found the antero-posterior or sacro-pubic diameter, by the fingers, measured only two and a half inches; but, using King's pelvimeter, this could be made

to register two and three-quarters inches, but by so doing the patient seemed to suffer much pain. The transverse diameter measured just about the same (namely two and three-quarters inches with pressure of pelvimeter); the oblique diameter measured also about two and three-quarters inches. She had consequently a uniformly-contracted pelvis. The difficulty was evidently in this case confined to the superior strait. The pubic bones were firmly knit together, and the rim, or top, of the pelvic basin seemed to go from this union in quite an acute angle. The external measurement between the tuber ischia was four inches. After confinement I found that Mrs. L. had a measurement around the hips, bringing the tape-line from behind to the front and just below the crest of the ilium, of thirty-two and a half inches; and below, around from behind by tuber ischia to pubis in front, of thirty-four inches. Her physical condition was any thing but promising. She was anæmic, with haggard aspect, her pulse weak; a decided amount of albumen was found in her urine when examined by heat and with nitric acid; and the most remarkable of her symptoms was a constant disposition to syncope; in fact so great was this that she would faint away eight to ten times during twenty-four hours, and remain insensible from five to twenty minutes during each attack. She told me she surely would die with the birth of this child, and her fear and anxiety were pitiable to witness. I felt at once the responsibility of such a case, and the discretion and judgment necessary to extricate the lady from her perilous condition. I, however, encouraged her as well as I could, and gave her a tonic of mur. tinct. iron, gtts. x, and quinine sulph., gr. ij, every three hours in simple sirup. This was about the end of December, 1870. By calculation from the date of the commencement of her last menstruation, her eighth month would terminate the 4th of the next month (January, 1871). Prof. F. N. Otis saw her with me the next day, and we determined upon the induction of premature labor, commencing on the latter date. Feeling the necessity here of being very cautious to avoid nervous shock, we determined to use a simple douche three times a day, and, thinking that probably an interrupted current, which could be pro-

duced with a Davidson syringe, would be more apt to bring on gentle uterine contractions than the continuous current of



Prof. Kiwisch, this course of action was determined on. At eleven o'clock in the morning of January 3, 1871, Dr. Otis met me at the house of patient. We allayed her fears by showing her the Davidson syringe and explaining the douche to her, and assuring her we did not intend to use any other instrumental means to effect her delivery; that the labor would be brought on so gently, it would seem as if it was the work of Nature, but that she must not expect the advent of her babe under a week.

A preliminary examination showed the os high up and rigid; the point of the index-finger could, however, readily pass through it, and a vertex presentation was determined. The vagina was quite dry. She was then placed by her nurse in position, in bed, on a rubber cloth, the ends of which were brought down into a large tub; her hips rested on the extreme edge of the bed, and her feet on the sides of the tub. Her head was kept moderately high by three pillows tucked under the rubber at her back. A bucket containing two gallons of water, of temperature 100° Fahr., was then placed in the tub, and after oiling the long tube I inserted it and gave her the douche of this quantity against the posterior lip of os. After this about an ounce of olive-oil was thrown high up in vagina, to counteract the extreme dryness apt to result from so hot a douche. She bore the operation remarkably well. She was then advised to get up and walk about, and, if she felt well later in the day, to take a short ride. Her diet was made generous, but of easily-digested material. At 9 P. M. I saw her again, and found her very comfortable. She complained that "during the afternoon she had had constant bearing down, as if she wanted to go to stool." The douche was repeated in the same manner, and the patient allowed to retire for the night.

Thursday, January 4th. 1 P. M.—Was detained from Mrs. L. until this hour by case of labor. Found her comfortable; she had occasional pain low down in back. Os less rigid, dilated to size of silver quarter. Gave douche of two gallons, and advised her to move about freely. 5 P. M.—Mrs. L. seemed somewhat exhausted, ordered milk-punch; condition otherwise the same. Repeated douche. 10 P. M.—Os more dilatable, but hardly any pain; again gave douche.

Friday, January 5th.—At 11 A. M. found Mrs. L. somewhat irritable about pains she frequently had in back, “little trifling things,” as she expressed it, “such as she always had for two or three days before labor.” Gave douche, but increased temperature to 110° Fahr., and all subsequent ones were of this temperature. She at first complained of the excessive heat, but only for a minute or two. During this douche she had two quite severe pains. I should have stated that on all these days she continued to have her fainting-attacks, but not more than five or six in twenty-four hours since she had been taking her tonic. She never had one while she was receiving the douche. 5 P. M.—Same condition; gave douche. 10 P. M.—Found Mrs. L. restless and nervous; had fainted twice since my last visit; constant pains in small of back, and frequent desire to micturate. During the afternoon it had grown intensely cold, and she seemed to feel it. The os more dilatable, and bag of waters pressing down to some extent. I introduced my finger and swept it around the lower segment of uterus, separating to some extent the membranes. This was the only mechanical interference on my part in this case. Gave douche. $12\frac{1}{2}$ P. M.—Called suddenly to my patient; found she had had a nervous rigor. I questioned her closely; she had no disagreeable head-symptoms, no puffiness of the face, no derangement of vision, but there was considerable edema of lower limbs. Prof. A. Flint, Jr., had examined her urine, and found a good deal of albumen, but no indication of positive renal trouble. Gave her a warm brandy-punch, and she soon went to sleep.

Saturday, 6th, 11 A. M.—Mrs. L. dressed and walking about room; feeling in better spirits and looking bright and cheerful. Os dilated to size of half-dollar, but with a

rigid "whip-cord"-like edge, otherwise condition the same; pains constant, but not of a character to effect much benefit. Douche. 4 P. M.—Again douche. 10 P. M.—Bag of waters pressed lower down, but os still rigid. Douche.

Sunday, 10 A. M.—Pains more frequent, but still not positive in character; Mrs. L., however, feeling well; at each visit she says she "is counting the hours to terminate her week." Os not quite so rigid. Gave douche. 4 P. M.—Douche. 10 P. M.—Pains more positive in character; waters pressing down; vagina full of secretion; os giving way, and every indication of labor. Repeated douche for the last time and ordered patient to retire and try to obtain some sleep.

Monday, 11th, 11 A. M.—Pains severe; membranes ruptured during one of these, and the fluid escaping in large quantities; the os dilated to size of silver dollar, but thick, hard, and unyielding; ordered patient to bed, and had her nourished on wine, beef-tea, and milk. Having determined from the first not to interfere unless there was some pressing danger, and as she had steadily improved in general health from the time she commenced to take the tonic, Nature was left to do her own work. 6 P. M.—Hard labor commenced, but it was well borne. The head remained fixed in the bony strait of the pelvis for two hours, and I greatly feared I would be obliged to apply forceps, but finally, about 11 $\frac{1}{4}$ P. M., I succeeded, by pressure above the pubes of the mother, in assisting her during one of her severe pains, and had the pleasure of seeing her give birth to a plump boy weighing five and a half pounds. The placenta came away without unusual trouble, and the patient was left comfortable and happy an hour after the birth of the child.

Tuesday, 12 M.—Mrs. L. in excellent condition; says "she never has felt so well after any of her previous confinements." She has passed her urine twice; pulse 80; hæmorrhage about natural. Condition of child good; has passed both urine and fæces twice. It is useless to pursue the subject further. Mrs. L. made a happy recovery, without a trouble of any character to mar it. Her milk appeared on the third day, and she nursed her boy, who grew finely, and is well and strong to-day.

It will thus be seen that in five days and twelve hours this

delivery was effected with hardly any inconvenience to the mother, and perfect safety to the child, by the simple Davidson syringe throwing an interrupted current of hot water.

Mrs. L. continued my patient, and again became pregnant about the 18th of October, 1873. This would make her mean time for delivery about the 20th of July, 1874. Her physical condition during this pregnancy was much better than the last. Digestion good, bowels regular; constant examinations of urine showed only a trace of albumen, and she had none of the fainting-spells. Her mind also was at ease, as, after her last comparatively easy delivery, she felt under my care safe for the future. The pregnancy progressed favorably, and in consultation with Prof. Otis it was again determined to allow her to go to the termination of the eighth month. This would be between the 18th and 20th of June. About the 10th of that month I made a preliminary examination, and found a very rigid os, high up, and almost completely closed. Gave her a small dose of extract of belladonna three times a day.

Thursday, June, 18, 1874.—Met Dr. Otis, at 1 P. M., and we found the belladonna and a laxative she had taken had had an excellent effect in relieving the rigidity of the os, as it was much softer, and readily admitted the index-finger. In approaching this second operation, I had determined to use the continuous current of hot water from a fountain-syringe, as advised by Kiwisch. For this purpose, had constructed a tin can with tight cover, and capacity of over two gallons. From the bottom of this was inserted a tin tube so arranged that the flow of water could be controlled and its force increased or lessened at pleasure. Over this tube the long rubber one was attached and then the can lifted three feet above the level of the bed by means of a light rope and pulley attached to the ceiling. Feeling so much in favor of the interrupted current, and for fear I might be prejudiced, made up my mind to give the continuous current the same opportunity the interrupted had had with last labor. After everything was arranged we gave the first douche of two gallons of water, at 110° Fahr. This was borne well, but, when the olive-oil had been injected and the patient allowed to rise,

she was attacked by sudden weakness, and we were obliged to give her some stimulant. After this she was sent out in the open air. 5 P. M.—No appreciable change in os; patient comfortable; gave douche. 11 P. M.—Os seemed more dilatable and softer; gave douche.

Friday, 19th, 10 A. M.—Mrs. L. doing remarkably well as to general health. Os higher up, and if anything more firmly contracted, than yesterday morning; gave douche; ordered active walking, but not to the point of fatigue. After each operation the weakness spoken of occurred, and I was obliged to administer brandy-and-water. This weakness was never shown after use of interrupted current. 4 P. M.—Douche. 9½ P. M.—Douche. No positive change in condition of patient.

Saturday, 20th, 11 A. M.—Patient was awakened two or three times through the night with pain of an irritating character; said “she felt as if something within her was bearing down;” digital examination revealed no appreciable change, except that the os seemed lower in vagina—gave douche. Mrs. L. has had a natural evacuation each day from bowels; passed urine freely, and this upon examination shows only traces of albumen. 4 P. M.—Douche. 9 P. M.—Douche.

Sunday, 21st, 11 A. M.—On examination, os seemed softer and more dilatable; she stated that “during night and morning, at intervals of a half-hour, slight pains had occurred in lower part of abdomen always before her pains commence in the back.” Some little nausea. Gave douche. 5 P. M.—Condition same; douche. 9½ P. M.—Patient complained of “pains lasting longer and being sharper.” Found os lower down, but still a hard ring, not larger than silver half-dollar; introduced finger to second phalanx, and swept it round, separating the membranes. Gave douche.

Monday, 22d, 11 A. M.—Patient had suffered with small pains since last night. General condition good. Condition of os not appreciably changed. During douche two quite severe pains, caused, no doubt, by my directing current directly within the os. 5 P. M.—Douche. 11 P. M.—Pains more frequent, about every fifteen minutes. Os seemed softer. Douche.

Tuesday, 23d, 11 A. M.—The regularity with which pains occurred yesterday has all passed away. Only a slight contraction at long intervals, and felt in lower part of abdomen. General condition good. Gave douche. 5 P. M.—Douche. 9½ P. M.—Condition unchanged. Mrs. L. getting impatient. Made some effort at dilatation with fingers, then gave douche.

Wednesday, 24th, 10 A. M.—To my great chagrin and disappointment, found condition of patient the same. She had some disposition to diarrhœa during the night; seemed languid, and said she “had lost her appetite.” 1 P. M.—Gave douche. 5 P. M.—Repeated douche.

Still no positive sign of labor, and as the time of the operation had already exceeded by twenty-four hours the time of delivery of the first case with the interrupted current, the patient being irritable and weaker, I determined to resort to more active means to hasten the delivery. Introduced the smallest size Barnes dilator. 9 P. M.—Returned, and found dilator in vagina, and introduced second size. 11 P. M.—Patient fretful and weak. Os more dilatable and softer, but no sign of positive labor; gave nervous anodyne, and ordered patient to retire for the night.

Thursday, 25th, 10 A. M.—Mrs. L. in better condition, but os had again contracted down and presented same condition as previous morning. Gave douche, and, as Dr. Otis had left town, requested Prof. Erskine Mason to meet me in consultation at 2 P. M. At that hour, after careful consideration, we thought, with the rigidity of os and the good condition of the patient, that it was better not to rupture membranes. The douche was given, and again at 10 P. M.

Friday, 26th.—Some greater dilatation of os. Bag of waters pressing lower down in vagina. Sent patient out for a walk after giving douche. At 6 P. M. found patient in same condition, and with consent of Dr. Mason ruptured the membranes during next pain. She at once lost a large quantity of amniotic fluid, so it was considered safer to keep her in bed; the presentation we both distinctly felt to be vertex.

Saturday, 27th, 12 M.—Dr. Mason met me at this hour by appointment. I was to have been sent for if her pains were more severe before that time. She informed us that

she had passed a comfortable night, had been disturbed occasionally with small pains, but that toward morning the active motion of the child had ceased. Upon examination, a shoulder was found presenting. The os was softer and dilatable. Dr. Mason gave her chloroform, and I quickly performed version. Having secured one foot and leg, passed my hand up to bring down the other, and found the cord between the limbs; slipping this off, with very little difficulty, the body was brought down. Had some trouble with the head in the superior strait, but after a few moments it was delivered. The cord was wound around the neck twice, and, during the change of position of the fœtus through the night, had in some way got between the limbs. The child gasped some two or three times, and Dr. Mason, for an hour, tried to resuscitate it, but without avail. It weighed nearly six pounds. The placenta was delivered without trouble, and the uterus contracted down well. She had, however, considerable "after-pains," and we gave her one-fourth of a grain of sulphate morphia at once, and ordered her to have one-sixth every three hours if required. Next morning her pulse was 120°, skin normal, abdomen soft; had urinated twice; tongue moist, soft, and clean. 5 P. M.—Found her with great tympanitis—pulse 120. Cutting pain in left groin. For several days after this she was very ill; but, by use of opiates and other appropriate treatment, she finally recovered.

Time from first douche to delivery, nine days.

I have detailed the circumstances connected with these two cases so fully, because it was necessary to demonstrate the difference of action between the continuous and interrupted currents of hot water on the muscular fibres of the uterus. With regard to the third case, I will speak of it very casually, and detain you only a few minutes longer.

Mrs. L. was not seen for some months, when on Wednesday, April 12, 1876, she came to my office and informed me that she had not menstruated since September 24, 1875. This would have made her mean time of delivery about June 25, 1876. She, however, presented the appearance of a woman who had reached full term. Upon questioning her, she informed me that during the last month her abdomen

had increased rapidly in size. The next day, Thursday, assisted by Prof. E. Mason, a careful examination was made of her condition. We decided that she had an amniotic dropsy. The fetal pulsation was very feeble, the os high up and rigid. The lower limbs of mother much swollen and œdematous, and her urine containing a decided amount of albumen. In addition to all this her general condition was not so good as in the second labor. We determined under the circumstances, fearing the life of the child and also danger to the mother, to induce labor as soon as she reached the end of the seventh month. This brought her to the 24th of April. On the evening of that day, Monday, the first douche was given with Davidson's syringe, of two gallons of water, of a temperature of 110° Fahr. On Tuesday, 25th, three were given. Wednesday, 26th, three were given, and in the evening of that day she felt decided pains. Thursday, 27th, three were given. Friday, 28th, three were given—all borne well; patient attending to her household duties and going about as usual. Saturday, 3 p. m., last douche given; pains about every fifteen minutes; membranes pressed down in vagina; os quite dilatable. 10 p. m., Saturday, Mrs. L. progressing favorably. 5 a. m., Sunday, April 30th, sent for in haste; found patient in second stage of labor; membranes had ruptured during the last pain. At 9 a. m. she, without assistance, gave birth to a little girl, weighing only three pounds. The child was feeble, but did well. Mrs. L. had no trouble whatever, and made an excellent and speedy recovery.

Time from first douche to delivery, five days, eleven and a half hours.

RECAPITULATION.

First Child.—First douche, Wednesday, January 3, 1872, 11½ a. m. Delivered Monday, January 8, 11½ p. m. Time of labor from first douche with interrupted current by Davidson's syringe, five days and twelve hours.

Second Child.—First douche, Thursday, June 18, 1874, 1 p. m. Delivered Saturday, June 27, 12 p. m. Time of labor from first douche with continuous current of Kiwisch, assisted by Barnes's dilators, and final rupture of membrane, nine days and twenty-three hours.

Third Child.—First douche, Monday, April 24, 1876, 9½ P. M. Delivered Sunday, April 30th, 9 A. M. Time of labor from first douche with interrupted current as in first case, five days, eleven and a half hours.

It is very evident, from the above, that the continuous current cannot be relied upon as a sole agent to induce premature labor. The first shock from this constant stream certainly produces an impression, and causes some softening and dilatation; but after this period the effect is to paralyze more than excite to action, as is shown in Case II.

The *rationale* of the action of the interrupted current is, first, a sort of flagellation to the muscular tissue of the uterus. The Davidson syringe, with each pressure of the bulb, throws, with a force corresponding to the quickness of the compressing power, about an ounce and a quarter of the fluid against the os. Consequently, to discharge in this manner two gallons, will take about twenty minutes, and require the bulb to be emptied in the neighborhood of three hundred and sixty-eight times. Repeat this three times a day, and we can readily see the disposition to action which such a prolonged and constant stimulus must give to so sensitive an organ as the uterus. That the effect is stimulating to the entire organism is shown in Cases I. and III. Mrs. L. absolutely improved in health during both deliveries, never grew faint under the operation, and always arose from her couch in good spirits and without feeling any inconvenience.

To the contrary, after the continuous current in the second case, she was so faint at the termination of each douche as to require assistance and stimulation. It must be remembered also that the patient was in much better condition of health during the second labor than in either of the others. For my second line of reasoning I am entirely indebted to the articles written on the subject of hot-water injections by Dr. Thomas Addis Emmet. As far as I can understand, he has taught since 1860 that the secondary effect of hot water applied in this way was to cause contraction. In his "Philosophy of Uterine Disease," page 19, he says: "It is generally conceived that the application of heat by this method relaxes the vessels and increases the congestion." This it does at first,

but, if prolonged, the capillaries are excited to increased action; as they contract, the tonic stimulus extends to the coats of the larger vessels, and their calibre becomes lessened."

On this ground I contend that the action of the interrupted douche of hot water by mechanical and constantly-recurring stimulation acts more rapidly than the continuous current, and first causes the smaller vessels about the os to contract, then the larger ones within the uterus. The result of this undoubtedly lessens the size of the womb itself, and, after the injection ceases, the returning flow of blood assists in exciting the organ to activity.

It will no doubt be considered by many that, in Case II., I should have sooner adopted some operative procedure to terminate the labor, but it must be remembered that each day I hoped to find natural contractions; and, besides, the patient was going about attending to her ordinary duties, and in no apparent danger.

In Case I. no account was kept of the fetal pulsations; but having read the paper of Dr. F. C. Wilson, of the Louisville City Hospital, before the commencement of the second case, an accurate examination was made for this purpose several times in Cases II. and III., with the following result:

Second Case.—Average number of fetal pulsations, 136. The child was a male.

Third Case.—Average number of fetal pulsations, 160. The child was a female.

Dr. Wilson says: "From 134 to 138, the sex will be doubtful, with chances in favor of female. From 143 to 170 the sex will be almost certainly female." It seems to me, however, that these rules cannot be laid down with any absolute certainty, as so much must depend upon the condition of health of the mother, and the action of her circulation.

A point of interest in this case showing the hereditary transmission of a certain part of the organism of one or the other parent to the offspring is demonstrated in the fact that, some time after the death of the mother of Mrs. L., her father married a second time. The first fruit of this wedlock was a girl—now a Mrs. G., living in this city. She is four years younger than Mrs. L.; it has been my duty to attend her

twice in labor, and she has a perfectly normal pelvis in shape and dimensions.

What are the advantages of this method compared with those now in vogue?

From the time of Dr. Macaulay, of England, who about the year 1756 or 1757 first induced premature labor, until that of Prof. Kiwisch, in 1846, every delivery of this kind was made with more or less instrumental interference. The latter undoubtedly appreciated the fact that the effort in this direction which most simulated the action of Nature would promise the greatest safety to mother and child. Hence his continuous current of hot water against the os.

The objections to perforating the membranes are manifold. The liquor amnii may escape so rapidly as to bring the walls of the uterus in direct contact with the child, thus endangering its existence.

As in Case II. related, the position of the child is liable to change. This has been thoroughly demonstrated at the "Maternité in Paris by Dubois."

Again, it may make the delivery tedious, by causing what is termed dry labor.

The dilatation of the os uteri by compressed sponge is the least objectionable of the forcible means for the induction of labor, but it is not always an easy matter to introduce prepared sponge of this kind without causing a good deal of irritation about the parts. In addition to this, statistics show that it has failed in a large number of cases.¹

Schoeller's vaginal tampon is, I believe, but little used to-day, on account of the great annoyance and suffering it caused the patients.

Barnes's dilators are invaluable where great haste is required, in cases of hæmorrhage or puerperal eclampsia.

The mechanical procedure of Mame, and others, of introducing gum-elastic bougies; Cohen's uterine injection, and forcing other foreign substances, between the walls of the uterus and the membranes, to stimulate contractions by separating the latter from the former, must, one would suppose,

¹ Bedford, "Principles and Practice of Obstetrics," p. 675.

give way entirely to the operation now performed by Prof. T. Gaillard Thomas. In an interview with that gentleman a few days ago, he gave me a minute account of his procedure. He introduces the nozzle of a Davidson's syringe to the os internum; this is held stationary by placing a finger on either side of the os externum; by this means, also, the rapid exit from the uterus of a portion of the fluid is temporarily prevented. The hot water is then gently thrown against the membranes, and between them and the body of the womb, thus separating the former and bringing on rapid contractions. He assured me that within twenty minutes the os would dilate to the size of a silver quarter, and that more than twenty-four hours were hardly ever required to complete the delivery, and frequently this object was accomplished in a much less time. One case where the first injection was given at seven o'clock, P. M., the babe was born by midnight. He also informed me that, although at his advice a number of physicians had tried this method, he had as yet to hear of the first unfortunate result. It will be noticed that this operation of Prof. Thomas differs in two particulars from that of M. Blot, Dr. Harting, and others, as mentioned in the early part of this paper, in that he uses the interrupted current of Davidson's syringe, and by placing a finger on either side of the os externum the partial return of the fluid is prevented. Although the doctor has been so successful with these intra-uterine injections, there are gentlemen on record who have not been so fortunate in injecting the pregnant womb.* Cazeaux, in speaking of this subject, p. 1011, says: "I also reported several cases of sudden death while the douche was being administered under the charge of such men as MM. Depaul, Salmon (of Chartres), and Simpson, whose skill is beyond questioning. Prof. Depaul, in relating his own case to the Surgical Society, thought he could account for the event by the introduction of a few bubbles of air into the uterine sinuses, and I think his explanation a good one, for in every instance the symptoms observed were those produced by the entrance of air into the veins." Prof. Leischman,¹ of Glasgow, says, "Simple and safe

¹ Leischman's "System of Midwifery," p. 536.

as this method may appear, later experience has shown that it is by no means free from risk, and fatal cases have been reported, in which death had occurred."

We all know that, for a week or two prior to delivery at natural term, the uterus, os, and soft parts, are preparing for the advent of the fœtus. The organ sinks lower in the cavity, the os becomes softer and dilates to some extent, and the soft parts secrete an abundance of mucus to lubricate the passage, and assist the final expulsive efforts of the womb. It will be remembered that in Cases I. and III. the delivery required five days and a half. The latter labor was accomplished in one half hour less time than the former. Consequently, from the character of the stimulant given to the organ to bring on gradual contractions, this preparatory stage, as in normal labor, was accomplished. This operation promises undoubted safety to both mother and child. There can be no comparative danger from inflammation of the soft parts, or the organ itself, in case the blood or tissues of the mother are deteriorated by any constitutional poison, because they are not in any way injured. The operation requires patience on the part of the medical attendant; but our profession is noted for possessing that virtue. And, lastly, the interrupted-current douche does not oblige the practitioner to penetrate beyond the external os. If we can succeed without this, we are fortunate, for the pregnant womb is a sacred tabernacle, containing life, the most precious of all the gifts of God, and, as such, deserves our greatest respect and most earnest consideration.



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